FOREST INSECT CONDITIONS
ON THE PAYETTE N.F. - 1971

Following is a report of forest insect activity on the Payette National Forest in 1971. Information and data contained herein were compiled from ground evaluations, forest detection reports, aerial and ground detection surveys.

The Douglas fir beetle continued to kill groups of trees in widely scattered areas; however, the number and size of attack centers have decreased. Biggest losses were experienced along the South Fork of the Salmon River. Lodgepole and second growth ponderosa pines suffered heavy mountain pine beetle attacks on adjacent private and Bureau of Land Management lands in Long Valley, south of McCall, and in other locations near forest lands of the west division. Western spruce budworm larvae caused increasing defoliation west, north, and east of McCall and in many other areas of the west division. An increase in both intensity and extent of defoliation was recorded in budworm plagued stands of the Idaho Primitive Area. Ips caused small scale losses; however, their activity continues to decline.

DOUGLAS FIR BEETLE - Dendroctonus pseudotsugae Hopk.

This destructive bark beetle continues to kill groups of Douglas fir on many areas of the forest. Due to the scattered nature of attack centers and rugged terrain with little or no access, logging suppression has been impractical. Also, to date, there is no known practical method for controlling this beetle when it reaches epidemic proportions.

Heaviest losses continue in side drainages along the lower South Fork of the Salmon River. Damage was observed in Rooster, North Fork Porphry, Deering and Slide Creeks. It was estimated that some groups of faders contained as many as 500 trees. Since 1970, annual counts of group attacks and numbers of trees per group have declined. Fading forest wide showed a marked decrease from 1970 to 1971. At present, it appears that natural factors have combined to break the back of the epidemic.

MOUNTAIN PINE BEETLE - Dendroctonus ponderosae Hopk.

Overall losses to this insect on National Forest lands were nominal during 1971. The small infestations reported in Goodrich and Olive Creeks on the Hornet Ranger District in 1970 declined, probably due to natural factors. Approximately 100 faded lodgepole pines were located in Johnson Creek Park. No evaluation was made of that area.

Elsewhere adjacent to forest lands, the beetle continues at epidemic levels in lodgepole pine along the North Fork of the Payette River, between McCall and Cascade Lake throughout Long Valley, and in stagnated second growth ponderosa pines east of McCall to south of Donnelly. Due to the proximity of these infestations to Forest Service lands, we have kept them under close surveillance and conducted biological evaluations.

MOUNTAIN PINE BEETLE - Ponderosa Pine

Private lands east of Donnelly were selected in Laffinwell Creek where 20 plots were cruised using a B.A.F. = 10. Ponderosa pine was the principle host species (Table1).

The host preference of the mountain pine beetle for small diameter stagnated ponderosa pine is evident in the 6 and 8 inch classes, each suffering nearly 40 percent losses. Thirty-five percent of this tree species has been lost from past and current year attacks. Presently, the duration of this infestation and total losses that will be incurred when it subsides cannot be predicted.

MOUNTAIN PINE BEETLE - Lodgepole Pine

Two areas with a wide variance of mountain pine beetle activity, past and present, were selected to determine damage trends. On all areas evaluated, lodgepole pine constituted at least 96 percent of the stand, with a range of 203 to 215 stems per acre (5.0" d.b.h. and larger).

One site, located two miles southwest of McCall, has been infested for at least six years (Table 2). Highest mortalities have been recorded in the larger diameter classes. If total tree height had been recorded and volume calculated, the cumulative losses would have been even more apparent. No live trees, 16" d.b.h. or larger were found. Fifty-two percent of the total lodgepole stand is green. Present cumulative losses on this site and lack of large diameter host trees to sustain the beetle are reflected in a decreasing trend which has been going on for the past two years.

The second stand sampled adjacent to and east of the Paddy Flat Guard Station complex extending to Rapid Creek, has a stand structure similar to what the first stand had six years ago. Cumulative attrition has been observed in all 2" diameter classes (7.6%). Eighty-one percent of the remaining stand is live lodgepole in 6 to 10 inch classes (Table 2). The general infestation in this basin is presently characterized by widely scattered groups and classed as endemic. However, based on the similarities of stand structure to those of the other area, the potential exists for similar losses in the Paddy Flat area in the near future.

Private land owners have shown little interest to date in wanting control of mountain pine beetle in lodgepole pine stands in Long Valley. Some infested stands have been logged by Boise Cascade Corporation.

Table 1. STAND STRUCTURE ANALYSIS (TREES PER ACRE) IN PREDOMINANTLY SECOND GROWTH PONDEROSA PINE STANDS DURING A MOUNTAIN PINE BEETLE INFESTATION, DONNELLY, IDAHO, 1971.

	Ponderosa Pine						Other Spp.		All Spp.	
	(Live)		(New Attk)		(Dead)		(Live)			
Diam. Class (in.)	Stems/ A	% of Stand	Stems/ A	% of Stand	Stems/ A	% of Stand	Stems/ A	% of Stand	Stems/ A	% of Stand
6	120.0	28.7	12.5	3.0	67.5	16.1	52.5	12.6	252.5	60.4
8	57.4	13.7	5.6	1.3	22.4	5.4	19.6	4.7	105.●	25.1
10	22.5	5.4	4.5	1.1	9.0	2.1	3.6	.9	39.6	9.5
12	6.6	1.6	1.2	.3	-	-	2.4	.6	10.2	2.4
14	4.0	1.0	.5	.1	-	-	-	-	4.5	1.1
16	2.4	.6	-	-	.4	.1	-	-	2.8	.7
16	3.0	.7	-	-	-	-	.3	.1	3.3	.8
	215.9		24.3		99.3		78.4		417.9	
		51.6		5.8		23.7		18.9		100.0

Basal Area/Acre

Ponderosa Pine	(Live)	74.5
	(N. Attacks)	8.5
	(Dead)	27.1
Other species	(Live)	22.0
	Total	132.1

C.V. = 55.2%
E% = 12.7

Table 2. STAND STRUCTURE ANALYSIS (TREES PER ACRE) OF TWO LODGEPOLE PINE STANDS, ORIGINALLY COMPARABLE IN STOCKING, AS AFFECTED BY THE PRESENCE OR ABSENCE OF A MOUNTAIN PINE BEETLE EPIDEMIC, PAYETTE NATIONAL FOREST, IDAHO, 1971.

McCall

	Lodgepole Pine						Other Spp. 1/		Total All	
	(Live)		(New Attk)		(Dead)		(Live)			
Diam. Class	Stems/ A	% of Stand	Stems/ A	% of Stand	Stems/ A	% of Stand	Stems/ A	% of Stand	Stems/ A	% o Sta
6	61.2	28.5	20.4	9.5	3.4	1.6	-	-	85.0	39
8	39.9	18.6	20.9	9.7	22.8	10.6	-	-	83.6	38
10	9.6	4.5	7.2	3.3	8.4	3.9	2.4	1.1	27.6	12
12	1.6	.7	3.2	1.5	7.2	3.3	-	-	12.0	5
14	.6	.3	.6	.3	2.4	1.1	.6	.3	4.2	1
16	-	-	-	-	1.0	.5	1.0	.5	2.0	1
> 16	-	-	-	-	.4	.2	-	-	.4	
	112.9		52.3		45.6		4.0		214.8	
		52.6		24.3		21.2		1.9		100

1/Ponderosa pine, Grand fir

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Paddy Flats

	Lodgepole Pine						Other Spp. 1/		Total All	
	(Live)		(New Attk)		(Dead)		(Live)			
Diam. Class	Stems/ A	% of Stand	Stems/ A	% of Stand	Stems/ A	% of Stand	Stems/ A	% of Stand	Stems/ A	% o Sta
6	75.0	36.9	-	-	5.0	2.5	-	-	80.0	39
8	72.8	35.9	1.4	.7	4.2	2.0	1.4	.7	79.8	39
10	17.1	8.4	.9	.4	2.7	1.3	4.5	2.5	25.2	12
12	12.0	5.9	-	-	.6	.3	-	-	12.6	6
14	2.0	1.0	-	-	.5	.2	-	-	3.0	1
16	1.2	.6	-	-	-	-	-	-	1.2	
> 16	.3	.2	-	-	.3	.2	.6	.3	1.2	
	180.4		2.3		13.3		7.0		203.3	
		88.9		1.1		6.5		3.5		100

1/Douglas fir, Grand fir, Ponderosa pine

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Basal Area/Acre		McCall	Paddy Flats
Lodgepole pine	(Live)	33.3	64.5
	(N. Attacks)	18.7	1.0
	(Dead)	24.0	5.5
Other species	(Live)	3.3	4.5
	Total	79.3	75.5

ENGRAVER BEETLES - Ips spp.

Considerable second growth ponderosa pine has been killed by outbreaks of Ips on National Forest land and surrounding state and private property. A result of this has been increasing interest on the part of all land managers in the Payette Forest area as to how Ips losses can be prevented.

One possible alternative would be to cut in such a manner that continuous green slash would be available from May or June through September, then burn infested slash in the last unit logged. This could only be done if logging units are in close proximity to each other so that emerging adults could be attracted to nearby fresh slash.

Considerable concern has been expressed over thinning in ponderosa pine stands with the inherent risk of creating an Ips infestation. An opportunity arose this year to evaluate effects of early season thinning when Boise Cascade Corporation thinned approximately 400 acres near Mud Creek west of New Meadows, Idaho. Boise Cascade cruise data showed a basal area of 198 square feet/A prior to thinning, and an end result of 55 sq. ft/A based on a B.A.F. = 10. Forty seven variable plots spaced every two chains were used to collect data.

Attacks in downed trees were well under way by mid-May when examination showed eggs, larvae, and pupae. Cruise lines were run through the area and no standing tree attacks were found. In mid-July a formal cruise of the area was made using a strip ten feet wide on either side of a center line. All felled trees within this strip were checked for evidence of Ips activity. Following is a resume' of findings:

Ips spp. Attacks in Felled Trees - Mud Creek Thinning Plots, Boise Cascade Lands

Diameter Class	% Attacks to Felled Whole Trees
4 - 5 in.	
6 - 7 in.	53
8 in.	

A total of 51 percent thinned trees were supporting broods of Ips and all life stages were observed. Also, emerging adults were observed and spot checks showed these individuals were filling into residual unattacked trees that had been felled in the late spring.

At this point Boise Cascade personnel made a decision to do more thinning in the same area to attract emerging adults. This was done in early July and again in late August. In addition, overstory felling of large diameter pines was done concurrently with the early July thinning and trees left in place. Boise Cascade foresters felt this procedure would trap additional beetles which would ultimately be destroyed at the mill.

Logging slash was piled and burned where overstory removal was done, after Ips had filled into felled trees. This burning, done in early September, effectively destroyed Ips in tops and limbs that had been attacked.

A late season check of thinned areas indicated that little, if any, standing tree attacks had occurred.

It appears that procedures used were effective in keeping current year attacks out of standing trees.

Boise Cascade plans another thinning operation immediately adjacent to the Mud Creek thinning area in 1971. They plan to use the same procedure -- starting over the snow in late February, March, and possibly into April. Providing Ips build up in the slash, they plan to drop more trees in the summer to absorb emerging adults.

We do not have current information that would indicate how large a population of Ips is overwintering in trees that were felled in July and August. We plan to make an early evaluation this coming spring to determine the status of these overwintering populations.

No conclusions can be made at this time as to the outcome of handling a thinning operation in this manner. We intend to recruise the 400 acre Mud Creek area in 1972 in an effort to determine if standing tree attacks occur and if losses could be termed significant.

WESTERN BUDWORM - Choristoneura occidentalis Free.

Budworm defoliation and area affected increased in 1971. Following is a four year resume' of budworm activity:

Year	Acres
1968	321,640
1969	362,200
1970	220,900
1971	316,200

Biggest increases in damage have been observed outside the Primitive Area north and west of McCall. Table 3 depicts defoliation intensity and acres affected for 1970 and 1971.

From the table it is apparent that budworm damage has increased almost 100,000 acres since 1970. Biggest areas of expansion have once again occurred in the Primitive Area and along the main Salmon River. An increase in defoliation intensity and acreage also occurred north of McCall along the North Fork of the Payette River where defoliation of new growth is expected to reach 90-100 percent in 1972.

Table 4 is a compendium of egg mass sampling data and defoliation predictions for next field season.

Three sample areas are shown in Table 4 for which 1971 data were not taken; therefore, a prediction trend could not be established.

Overall, budworm activity is expected to increase or at least remain static. The infestation does not warrant control consideration.

PINE BUTTERFLY - Neophasia menapia (F.&F.)

The pine butterfly, which has been at low levels of activity since 1954, showed increasing trends along the main Salmon River in ponderosa pine stands. Observations since 1969 have shown increasing numbers of adults in flight. Commensurate with this, observers detected light defoliation in several widespread locations.

Historically defoliation by the pine butterfly has caused extensive mortality to pine stands; however, available figures as to actual numbers of trees killed are not reliable.

In many cases butterfly populations have increased to where marked defoliation was observed and then subsided rapidly due to natural control factors. In cases of this type little if any actual tree killing occurred. However, losses in radial growth were experienced.

From 1952 to 1954 a butterfly epidemic was experienced on the Boise National Forest. This infestation was controlled in part by aerial spraying and natural controls such as predators and parasites.

Cole (1966) showed that defoliation caused growth reduction of approximately 39 percent during the peak of the infestation.

TABLE 3

DEFOLIATION INTENSITY AND ACRES AFFECTED
1970-1971 PAYETTE N.F. - WESTERN BUDWORM

	1970			1971			Total	
	Light	Moderate	Heavy	Light	Moderate	Heavy	1970	1971
Big Creek (Primitive Area)	-		12,000	39,600	20,300	2,600	12,000	62,500
Main Salmon River Between Mackay Bar & Riggins	17,400	15,700	400	51,800	10,200	11,300	33,500	73,300
Little Salmon River & Tributaries	29,900	14,300	2,900	19,800	32,900	5,700	47,100	58,400
Secesh River & Tributaries	6,600	6,100	300	8,700	3,800	400	13,000	12,900
Payette Lakes & North Fork	34,000	14,200	400	36,900	16,300	3,200	48,600	56,400
Upper So. Fork Salmon R. (Krassel)	14,400	8,800	900	11,700	1,900	800	24,100	14,400
Rapid River	7,100	4,700	-	4,000	400	-	11,800	4,400
Hells Canyon	1,200	100	-	2,100	400	-	1,300	2,500
Bear River	5,600	700	-	6,000	-	-	6,300	6,000
S.Fk. Salmon River Between Mackay Bar & Secesh R. Entry	5,200	2,300	-	15,600	1,600	-	7,500	17,200
Weiser River	11,800	1,000	-	7,100	1,100	-	12,800	8,200
							218,000	316,200

TABLE 4

1971 SPRUCE BUDWORM EGG MASS SURVEY DATA
AND DEFOLIATION PREDICTIONS

	No. Masses/30 in. Branch New	1971 Defoliation Prediction	1972 1/ Defoliation Prediction	Trend
Warren Summit	2	15%	51-90%	Increasing
Wagon Bay	7	15-25%	51-90%	Increasing
Brown Pond North	3	no sample	15-25%	
Big Creek #1	12	no sample	90-100%	
Boulder Creek	1	15-25%	25-50%	Increasing
Cow Creek	2	15%	15%	Same
West Br. Weiser R.	4	51-90%	90-100%	Increasing
Sister Creek	4	15%	15%	Same
Split Creek	5	15%	15%	Same
Smoky	10	51-90%	25-50%	Decreasing
Edmunson Cabin	9	no sample	51-90%	
Hat Creek	5	15-25%	15%	Decreasing
Goose Creek	14	51-90%	90-100%	Increasing
Paddy Creek	0	15-25%	15-25%	Same
N. Fork Payette R.	5	51-90%	90-100%	Increasing
N.E. end Payette Lake	15	25-50%	90-100%	Increasing

1/ Based on 1971 egg mass survey

It is interesting to note that Region 1 pine stands, immediately north of the Salmon River, suffered heavy defoliation in several areas this year. Conversely, only a river width away, Region 4 stands had only light defoliation. We have no explanation for this phenomenon.

Egg mass sampling was done in two locations: Secesh River near Brown's Camp and Studebaker Saddle on the main Salmon River. All samples from the Secesh River plots were negative. Conversely, an average of 56.6 eggs per branch were tallied from the Studebaker Saddle plots. This extremely high figure by far exceeds epidemic classifications set forth by earlier studies, i.e.:

2 or more	eggs	per	branch			- endemic
2-4	"	"	"	"	"	- light
5-8	"	"	"	"	"	- moderate
9	"	"	"	"	"	- heavy (epidemic)

As data was available from only one of the two sampling areas, it is conceivable that a localized "hot spot" was evaluated and that surrounding stands were not supporting such high egg deposition rates. On the other hand, heavy defoliation of pines was recorded directly across the Salmon River less than one air mile. There is a distinct possibility that butterflies migrated across the river to oviposit which could partially account for the heavy egg deposition encountered.

Currently we are not at a point where pine butterfly defoliation is causing significant losses. However, there is a decided upward trend in this insect's activity. We plan to establish several sampling plots in areas on the Boise and Payette Forests in 1972 to monitor butterfly activity.

If butterfly populations and attendant increases in defoliation continue, then consideration may have to be given for or against control action.

Cole, Walter E.
1966 Effect of Pine Butterfly Defoliation on Ponderosa Pine in Southern Idaho. USDA-Forest Service, Research Note INT-46.